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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: INDOLE DERIVATIVES HAVING ANTI-ANGIOGENETIC ACTIVITY

$$(R^{1})_{q} = (CH_{2})_{p} = X + (R^{2})_{p} = R^{4}$$

$$(R^{2})_{p} = X + (R^{2})_{p} = R^{4}$$

$$(R^{2})_{p} = R^{4}$$

(57) Abstract: The invention relates to the use of a compound of Formula (I), for the manufacture of a medicament to inhibit and/or reverse and/or alleviate symptoms of angiogenesis and/or any disease state associated with angiogenesis: Formula (I); wherein: X, p, q, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, and R<sup>5</sup> are as defined in the description. The invention also relates to use of compounds of Formula (I) as medicaments and also to novel compounds of Formula (I). The invention further provides pharmaceutical compositions of compounds of Formula (I) and processes for the synthesis of compounds of Formula (I).



Internati plication No PCT/GB 03/01405

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A61K31/404 A61K31/405

A61P35/00

CO7D209/42

C07D209/18

CO7D209/12

According to International Patent Classification (IPC) or to both national classification and IPC

#### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61K C07D A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BEILSTEIN Data, CHEM ABS Data

C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with Indication, where appropriate, of the rel	levant passages Relevant to cla	im No.
A	WO 01 92224 A (ASTRAZENECA) 6 December 2001 (2001-12-06) cited in the application Abstract; page 1, lines 3-9; cla- examples.	1-12 ims 1-13;	
A	US 4 533 672 A (FURR BARRINGTON AL) 6 August 1985 (1985-08-06) Abstract; claims 1-6.	J A ET 1-12	
Ρ,Χ	WO 02 070478 A (ASTRAZENECA) 12 September 2002 (2002-09-12) Abstract; page 1, lines 2-8; clarexamples.	ims 1-20;	
E	EP 1 297 833 A (PFIZER PROD INC) 2 April 2003 (2003-04-02) Abstract; claim 1.	1-12	
X Furti	ner documents are listed in the continuation of box C.	X Patent family members are listed in annex.	
"A" docume consid "E" earlier of filing d "L" docume which citation "O" docume other r "P" docume	nt which may throw doubts on priority claim(s) or is cited to establish the publication date of enother n or other special reason (as specified) and the referring to an oral disclosure, use, exhibition or	<ul> <li>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</li> <li>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</li> <li>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combined with one or more other such documents, such combination being obvious to a person skilled in the art.</li> <li>"&amp;" document member of the same patent family</li> </ul>	
	actual completion of the international search 2 December 2003	Date of mailing of the international search report  2 2. 01. 2004	
Name and n	nalling address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo ni, Fax: (+31–70) 340–3016	Authorized officer Weisbrod, T	



Internetic Ication No PCT/GB 03/01405

C.(Continu	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Retevant to claim No.
A	CH 414 639 A (SANDOZ AG) 15 June 1966 (1966-06-15) Claims; examples 2 and 3.	1–12
X	SHEPPARD G S: "3-(2-(3-Pyridinyl)thiazolidin-4-oyl)indoles, a novel series of platelet activating factor antagonists" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, US, vol. 37, no. 13, 1994, pages 2011-2032, XP002170395 ISSN: 0022-2623	12
A	Page 2022, right column: preparation of 6-((4-fluorophenyl)methoxy)indole.	1-11
Α	KWONG, F. Y.; BUCHWALD, S. L.: "A General, Efficient; and Inexpensive Catalyst System for the Coupling of Aryl Iodides and Thiols" ORG. LETT., vol. 4, no. 20, 2002, pages 3517-3520, XP002251752 Page 3519, table 2, entry 10.	1–12
Α	DATABASE CROSSFIRE BEILSTEIN 'Online! Beilstein Institut zur Foerderung der chemischen Wissenschaften, Frankfurt/Main, DE; XP002251753 Database Accession No. 8172403 (BRN). & PHARM. CHEM. J. (ENGL. TRANSL.), vol. 32, no. 1, 1998, pages 29-32,	1-12
х	DATABASE CROSSFIRE BEILSTEIN 'Online! Beilstein Institut zur Foerderung der chemischen Wissenschaften, Frankfurt/Main, DE;	12
A	XP002251754 Database Accession No. 183150 (BRN), Reaction 2 of 14.	1–11
	& TETRAHEDRON, vol. 49, no. 48, 1993, pages 11155-11168,	
	-/	



Internati Illication No PCT/GB 03/01405

		FC1/GB 03/01403
C.(Continua	tion) DOCUMENTS CONSIDERED TO BE RELEVANT	
Calegory °	Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to claim No.
Х	DATABASE CROSSFIRE BEILSTEIN 'Online! Beilstein Institut zur Foerderung der chemischen Wissenschaften, Frankfurt/Main, DE;	12
A	XPÓ02251755 Database Accession No. 207989 (BRN), Reaction 1 of 2.	1-11
	& HELV. CHIM. ACTA, vol. 42, 1959, pages 2073-2098, 	
X	DATABASE CROSSFIRE BEILSTEIN 'Online! Beilstein Institut zur Foerderung der chemischen Wissenschaften, Frankfurt/Main, DE;	12
A	XP002251756 Database Accession No. 5433848 (BRN), Reaction.	1-11
	& CHEM. HETEROCYCL. COMPD. (ENGL. TRANSL.), vol. 27, no. 11, 1991, pages 1218-1221,	
Α	MONGE A ET AL: "NEW INDOLE AND PYRIDAZINOINDOLE ANALOGS - SYNTHESIS AND STUDY AS INHIBITORS OF PHOSPHODIESTERASES AND AS INHIBITORS OF BLOOD PLATELET AGGREGATION" ARCHIV DER PHARMAZIE, VCH VERLAGSGESELLSCHAFT MBH, WEINHEIM, DE, vol. 328, no. 10, October 1995 (1995-10), pages 689-698, XP000998422 ISSN: 0365-6233 Pages 690 and 695, compound 5.	1-12



#### INTERNATIONAL SEARCH REPORT

Internauonal application No.
PCT/GB 03/01405

Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet) This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons: Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely: 1-12 (part) Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically: see FURTHER INFORMATION sheet PCT/ISA/210 Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a). Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet) This international Searching Authority found multiple inventions in this international application, as follows: see additional sheet As a result of the prior review under R. 40.2(e) PCT, no additional fees are to be refunded. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee. As only some of the required additional search fees were timely paid by the applicant, this international Search Report covers only those claims for which fees were paid, specifically claims Nos.: No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the Invention first mentioned in the claims; it is covered by claims Nos.: The additional search fees were accompanied by the applicant's protest. Remark on Protest No protest accompanied the payment of additional search fees.



#### FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-12 (all part)

involving compounds (I), (V), (VIId), (VI), and (VIIc) wherein R3 is different from cyano;

2. Claims: 1-12 (all part)

involving compounds (I), (V), (VIId), (VI), and (VIIc) wherein R3 is cyano and R4 is different from amino and different from NR6R7.



#### FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-12 (part)

Second medical use claims 1-5 are in part functionally defined by reference to "disease states associated with angiogenesis", whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a limited number of such disease states (cf. page 1, lines 25-28). In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the claimed matter by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to angiogenesis and the disease states mentioned in the description, page 1, lines 25-28.

In addition, the scope of the claims 1-12 in as far as the expression prodrug is concerned, is so unclear (Article 6 PCT) that a meaningful search is impossible with regard to this expression. Consequently, the said claims have not been searched in as far as the term prodrug is concerned.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.



Internati pplication No PCT/GB 03/01405

	itent document in search report		Publication date		Patent family member(s)		Publication date
WO	0192224	Α.	06-12-2001	AU	5862801	Α	11-12-2001
				BR	0111230	Α	10-06-2003
				CA	2406979	A1	06-12-2001
				CN	1431999	T	23-07-2003
				EP	1289952		12-03-2003
				MO	0192224		06-12-2001
				JP		T	25-11-2003
				NO	20025696		27-11-2002
				· US <sup>·</sup>	2003216356	A1	20-11-2003
US	4533672	A	06-08-1985	AT	26261		15-04-1987
				AU	563413		09-07-1987
				AU	2054883		03-05-1984
				CA	1205078		27-05-1986
				DE	3370619	D1	07-05-1987
				EP	0107963		09-05-1984
				ES	8504707		16-07-1985
				FI	833958		29-04-1984
				GR	79404		22-10-1984
			•	ΙE	56125		24-04-1991
				ΙL	70111		30-11-1987
				JP	59095257		01-06-1984
				NO			30-04-1984
				NZ	206080		23-01-1987 01-11-1983
				PT ZA	77574 8307829		29-08-1984
					830/829 		29-06-1964
WO	02070478	Α	12-09-2002	EP	1370527		17-12-2003
				WO	02070478	A1	12-09-2002
EP	1297833	A	02-04-2003	BR	0203877		16-09-2003
_				CA	2404848		26-03-2003
				EP	1297833		02-04-2003
				JP	2003160559		03-06-2003
				US	2003078289	A1	24-04-2003
	414639	A	15-06-1966	NONE			